

### **REMARKS/ARGUMENTS**

After the foregoing Amendment, Claims 1-4 and 12-15 are currently pending in this application. Claims 5-11 have been cancelled without prejudice. Claims 1-3 have been amended. New claims 12-15 are added. Applicants submit that no new matter has been introduced into the application by these amendments.

#### **Claim Rejections - 35 USC §112, first paragraph**

Claims 1– 11 have been rejected under 35 U.S.C. §112, first paragraph, because the specification does not provide enablement of using an infrared camera in the range of 3-12  $\mu m$ . Claims 1– 11 have also been rejected under 35 U.S.C. §112, first paragraph, for violation of written description requirement for the same reason.

Applicants disagree with the Examiner. However, in order to expedite the examination, claims 1-3 have been amended to remove the feature that the infrared camera is operating in an infrared range of 3-12  $\mu m$ .

Therefore, withdrawal of 35 U.S.C. §112 rejection is respectfully requested.

#### **Claim Rejections - 35 USC §103(a)**

Claims 1-4 have been rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 7,094,164 to Marty et al. (hereinafter “Marty”) in view of U.S. Patent No. 5,206,503 to Toops (hereinafter “Toops”).

With respect to claim 1, Marty and Toops fail to teach recording trajectories of infrared footmarks resulting from an interaction of the object with a surrounding object or a surrounding environment.

In Marty, an infrared light source illuminates the object and an infrared camera detects an infrared light reflected from the object, (i.e., the trajectory of the sport object itself is detected and recorded). In contrast, in claim 1, the trajectory of the infrared footmark resulting from an interaction of the object with a surrounding object or environment is recorded.

The infrared footmark refers to a part or entire surface of an object (ball, court, medium) having a temperature differing from that of the environment or other parts of the object, and the footmarks may result from the contact of the object with another object or surface. The infrared footmark results from an interaction of the object with a surrounding object or environment, (e.g., resulting from the impact with another object or surroundings). For example, in tennis, the infrared footmarks may be formed as a result of an impact to a ball by a racket or with a surface of the court; (see paragraph 0016). The infrared footmark may have a positive value if it results from inelastic impingement of two objects, and in this case the temperature of the contact area would be higher than that of surrounding bodies or parts of the object; (see paragraph 0013). The captured infrared footmarks are thermal changes in the place of an impact of a ball, (for example, with the court surface), wherein the thermal footmark remains for some time period both on the

court surface and on the ball surface. In contrast, Marty merely discloses detecting the object itself.

Toops is cited for teaching that the infrared detector device is tuned to 3-5  $\mu m$  and 8-12  $\mu m$ . The feature operating an infrared camera in an infrared range of 3-12  $\mu m$  has been removed from claims 1-3. Therefore, Toops is irrelevant.

Marty and Toops fail to teach recording trajectories of infrared footmarks resulting from an interaction of the object with a surrounding object or environment. Therefore, claim 1 and its dependent claims are not obvious over Marty and Toops.

With respect to claim 2, Marty fails to teach recording trajectories of the infrared footmarks in different spectral ranges within a middle infrared range. Marty discloses that the object may be recorded both in infrared and visible light range. However, Marty further discloses that when the camera records both infrared and visible light, the camera may include filters for minimizing visible light to enhance the infrared signature of objects. Therefore, Marty teaches away from recording the footmarks in different ranges. In addition, Marty fails to teach recoding the footmarks in different ranges within a middle infrared range. Therefore, claim 2 is not obvious over Marty and Toops.

With respect to claim 3, Marty fails to teach recording trajectories of shadows resulting from an interaction of the object with concentrated or distributed external sources of infrared radiation within a middle infrared range. By recoding the

shadow, as a supplementary factor, a more accurate calculation of the object movement parameters is achieved.

Examiner asserts that even though Marty does not explicitly describe the use of object shadow, consideration of the object shadow is understood as inherent since without such consideration the system of Marty would not function as disclosed. Applicants respectfully disagree. Marty discloses detecting the infrared which illuminated by the light source and reflected from the object, and uses only that information for calculating the trajectory of the object. Marty fails to teach recording the shadow of the object and using it as a supplementary factor for calculating the object trajectory. Therefore, claim 3 is not obvious over Marty and Toops.

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**Application No.:** 10/540,948

**Conclusion**

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephone interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing amendment and remarks, Applicants respectfully submit that the present application, including claims 1-4 and 12-15, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

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